

What is claimed is:

1. An RFID interrogator, comprising:
an antenna configured to transmit and receive signals;
an amplifier configured to amplify a transmit signal; and
an energy director coupled with the antenna and the amplifier, the energy director configured to receive the amplified transmit signal from the amplifier and send the amplified transmit signal to the antenna, and to receive a receive signal from the antenna and direct the receive signal to a receive path.
2. The RFID interrogator of claim 1, wherein the antenna transmits signals to, and receives signals from, an RFID tag.
3. The RFID interrogator of claim 1, wherein the energy director comprises a director at the input of the amplifier, and a director at the output of the amplifier.
4. The RFID interrogator of claim 3, wherein the directors are circulators.
5. The RFID interrogator of claim 3, wherein the directors are directional couplers.
6. The RFID interrogator of claim 1, wherein the amplifier is a variable gain amplifier (VGA).
7. The RFID interrogator of claim 1, further comprising a feedback loop coupled with the output of the amplifier, the feedback loop configured to sense the output

energy from the amplifier and control the amplifier gain in response to the sensed output energy.

8. The RFID interrogator of claim 7, wherein the feedback loop maintains the transmit signal energy at or below a certain level.

9. The RFID interrogator of claim 7, wherein the feedback loop maintains the transmit signal energy at or above a certain level.

10. The RFID interrogator of claim 7, wherein the feedback loop includes an energy coupler, a rectifier, and a power leveling network.

11. The RFID interrogator of claim 1, wherein the energy director is coupled with an RF transceiver, configured to process the received signal.

12. The RFID interrogator of claim 11, wherein the energy director is configured to direct the receive signal around the amplifier and to the RF transceiver.

13. The RFID interrogator of claim 11, wherein the energy director is configured to direct the transmit signal from the RF transceiver to the amplifier, and from the amplifier to the antenna.

14. The RFID interrogator of claim 11, wherein the RF transceiver is configured to send the receive signal to a decoder.

15. The RFID interrogator of claim 1, wherein the energy director is coupled with a switch, the switch configured to direct the transmit signal to one of a plurality of antennas.

16. The RFID interrogator of claim 1, wherein the energy director is coupled with a plurality of switches, each of the plurality of switches configured to direct the transmit signal to one or more of a plurality of antennas.

17. The RFID interrogator of claim 1, wherein the transmit signal is transmitted to a RFID tag.

18. The RFID scanner of claim 1, wherein the received signal contains data from the RFID tag.

19. A method for amplifying a transmit signal in a RFID interrogator, comprising:

generating a transmit signal:

amplifying the transmit signal to a certain power level; and

transmitting the amplified transmit signal to at least one RFID tag.

20. The method of claim 19, further comprising sensing the power level of the amplified transmit signal and generating a control signal based on the sensed power level.

21. The method of claim 20, further comprising controlling the amplification of the transmit signal using the control signal.

22. The method of claim 20, further comprising generating a voltage signal based on the sensed power level of the transmit signal and rectifying the voltage signal.

23. The method of claim 20, further comprising controlling the amplification of the transmit signal so that the power level of the transmit signal is within certain limits.

24. The method of claim 19, further comprising receiving a signal and routing the received signal around the amplifier via a bypass path.

25. An RFID interrogator system, comprising:
an plurality of antennas configured to transmit and receive signals; and
a plurality of amplifier switch block coupled with the plurality of antennas, each of the plurality of amplifier switch blocks comprising:

an amplifier configured to amplify a transmit signal; and

an energy director coupled with the some of the plurality of antennas and the amplifier, the energy director configured to receive the amplified transmit signal from the amplifier and send the amplified transmit signal to the antennas, and to receive a receive signal from the antennas and direct the receive signal to a receive path.

26. The RFID interrogator system of claim 25, wherein the plurality of antennas transmits signals to, and receives signals from, an RFID tag.

27. The RFID interrogator system of claim 25, wherein the energy director comprises a director at the input of the amplifier, and a director at the output of the amplifier.

28. RFID interrogator system of claim 27, wherein the directors are circulators.

29. RFID interrogator system of claim 27, wherein the directors are directional couplers.

30. The RFID interrogator system of claim 25, wherein the amplifier is a variable gain amplifier (VGA).

31. The RFID interrogator system of claim 25, wherein each of the plurality of amplifier switch blocks further comprises a feedback loop coupled with the output of the amplifier, the feedback loop configured to sense the output energy from the amplifier and control the amplifier gain in response to the sensed output energy.

32. The RFID interrogator system of claim 31, wherein the feedback loop maintains the transmit signal energy at or below a certain level.

33. The RFID interrogator system of claim 31, wherein the feedback loop maintains the transmit signal energy at or above a certain level.

33. The RFID interrogator system of claim 31, wherein the feedback loop includes an energy coupler, a rectifier, and a power leveling network.

34. The RFID interrogator system of claim 25, wherein the energy director is coupled with a RF transceiver, configured to process the received signal.

35. The RFID interrogator system of claim 34, wherein the energy director is configured to direct the receive signal around the amplifier and to the RF transceiver.

36. The RFID interrogator system of claim 33, wherein the energy director is configured to direct the transmit signal from the RF transceiver to the amplifier, and from the amplifier to the antenna.

37. The RFID interrogator system of claim 33, wherein the RF transceiver is configured to send the receive signal to a decoder.

38. The RFID interrogator system of claim 25, wherein the energy director is coupled with a switch, the switch configured to direct the transmit signal to one of the plurality of antennas.

39. The RFID interrogator system of claim 25, wherein the energy director is coupled with a plurality of switches, each of the plurality of switches configured to direct the transmit signal to one or more of the plurality of antennas.

40. The RFID interrogator system of claim 25, wherein the transmit signal is transmitted to an RFID tag.

41. The RFID interrogator system of claim 25, wherein the received signal contains data from the RFID tag.